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Charles Dietz
Utah Division of Environmental Health
288 North 1460 West
Box 16690
Salt Lake City, Utah 84116

Dear Mr. Dietz,

As requested, Steve Brooks has prepared a report summarizing the Timberline heap leach cleanup and neutralization project which involved six days of work from October 16 through 26, 1989. Neutralization was based on results of bench tests which concluded that a dilute hydrogen peroxide solution would neutralize the cyanide to levels below 2 ppm total and 1 ppm WAD. The heap leach contained 4700 tons of ore having considerable fines, resulting in low permeability.

Results of neutralization are shown in table 1. The neutralizing solution consisted of 1000 ppm H2 O2, buffered with NaOH to ph of 11 and 25 ppm CuS04 to aid complexing. The solution was applied in 900 gallon batches with a hydroseeder by Barrick Mercur Mine personnel. Following application of the solution about 13,000 gallons of water was sprayed on the pile to saturate approximately 1 1/2 feet of the heap. The solution was mixed with the bulldozer for about 1 hour and pushed off pile into the solution pond. The major limitation appeared to be difficulty in thoroughly mixing the neutralizing solution into the heap.

Trash and the remaining building were sprayed with the neutralizing solution and taken to the Tooele County dump. Reclamation consisted of backfilling the solution pond and contouring the heap to a low mound, to minimize ponding of water. The area inside the fence was hydromulched with an eight species mixture.

The neutralization has reduced the heap leach to non-toxic levels, however, state standards were not met. To document longer term compliance with State standards it is proposed that

the site be sampled at six month intervals to monitor expected further reductions in cyanide levels. The samples taken during neutralization will be reanalyzed in two weeks and four weeks to verify expected additional reductions in cyanide levels as oxidization by hydrogen peroxide, and other reactions continue.

JORDON G. POPE

Deane Zeller
District Mannager

cc: Matt Trujillo

Wayne Hedberg

Table 1

Cyanide levels - Timberline Heap Leach

Sample collected on 9/27/89:

before treatment

	total cyanide	142 mg/kg
	WAD cyanide	1.55 *

Sample collected 10/25/89:

before treatment

	total cyanide	141
	WAD cyanide	57.2

After bench leach treatment

	total cyanide	2.16
	WAD cyanide less than	0.2

Samples collected on 10/17/89
after treatment on site

#1	total cyanide	29.73
	WAD cyanide	2.41
#2	total cyanide	29.58
	WAD cyanide	2.36

Samples collected on 10/18/89
after treatment on site

#1	total cyanide	29.81
	WAD cyanide	5.26
#2	total cyanide	30.82
	WAD cyanide	5.12
#3	total cyanide	29.81
	WAD cyanide	7.31

Samples collected on 10/19/89
after treatment on site

#1	total cyanide	25.48
	WAD cyanide	4.63
#2	total cyanide	21.64
	WAD cyanide	4.16
#3	total cyanide	27.02
	WAD cyanide	6.23

#4	total cyanide	22.89
	WAD cyanide	5.49

Samples collected on 10/25/89
after treatment on site

#2	total cyanide	30.68
	WAD cyanide	9.37
#3	total cyanide	27.34
	WAD cyanide	5.01

Sample collected on 10/26/89
after treatment on site

#1	total cyanide	29.55
	WAD cyanide	23.35*
#2	total cyanide	29.09
	WAD cyanide	5.80
#3	total cyanide	3.94
	WAD cyanide	1.82

Average total cyanide before treatment	141.5
WAD cyanide before treatment	57
Average total cyanide after treatment	24.03
WAD cyanide after treatment	6.3

* Anomalous cyanide level
inconsistent with other analysis